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Testing & Experimentation

How to Better Support the Need for Quick Reaction Capabilities in an Irregular Warfare Environment

"Breaking the Terrorist/Insurgency Cycle"

April 6, 2009

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Director, Rapid Reaction Technology Office (RRTO)

The Risk of Military Certainty in Planning & Procurement

"May 1, and the days of planning were over. That morning the variou
Commanders swarmed aboard the Yamato for four days of briefing ar
maneuvers. As they tried out the plan on the game board, Red Team
fleet) unexpectedly caught Blue Team (Nagumo's carriers) while thei
were off bombing Midway. Rear Admiral Matome Ugaki, Yamamoto's
chief of staff, hastily reversed the umpire; six hits were erased and t
re-floated….Success thus assured, the mimeograph machines began
Walter Lord, "Incredible Victory"
***The Japanese lost four aircraft carriers at the Battle of Midway**

"The late war, more than any other, involved the interplay of new tec
measures and opposing countermeasures. For example, the German
had to revise their tactics and equipment when we began to use rada
anti-submarine aircraft; and we, in turn, had to modify our tactics an
equipment to counter their changes. In the see-saw of techniques th
countered quickly, before the opponent had time to perfect the new
weapons, had the decided advantage." Admiral E.J. King, 1945
Brian McCue, "U-Boats in the Bay of Biscay, An Essay in Operations A

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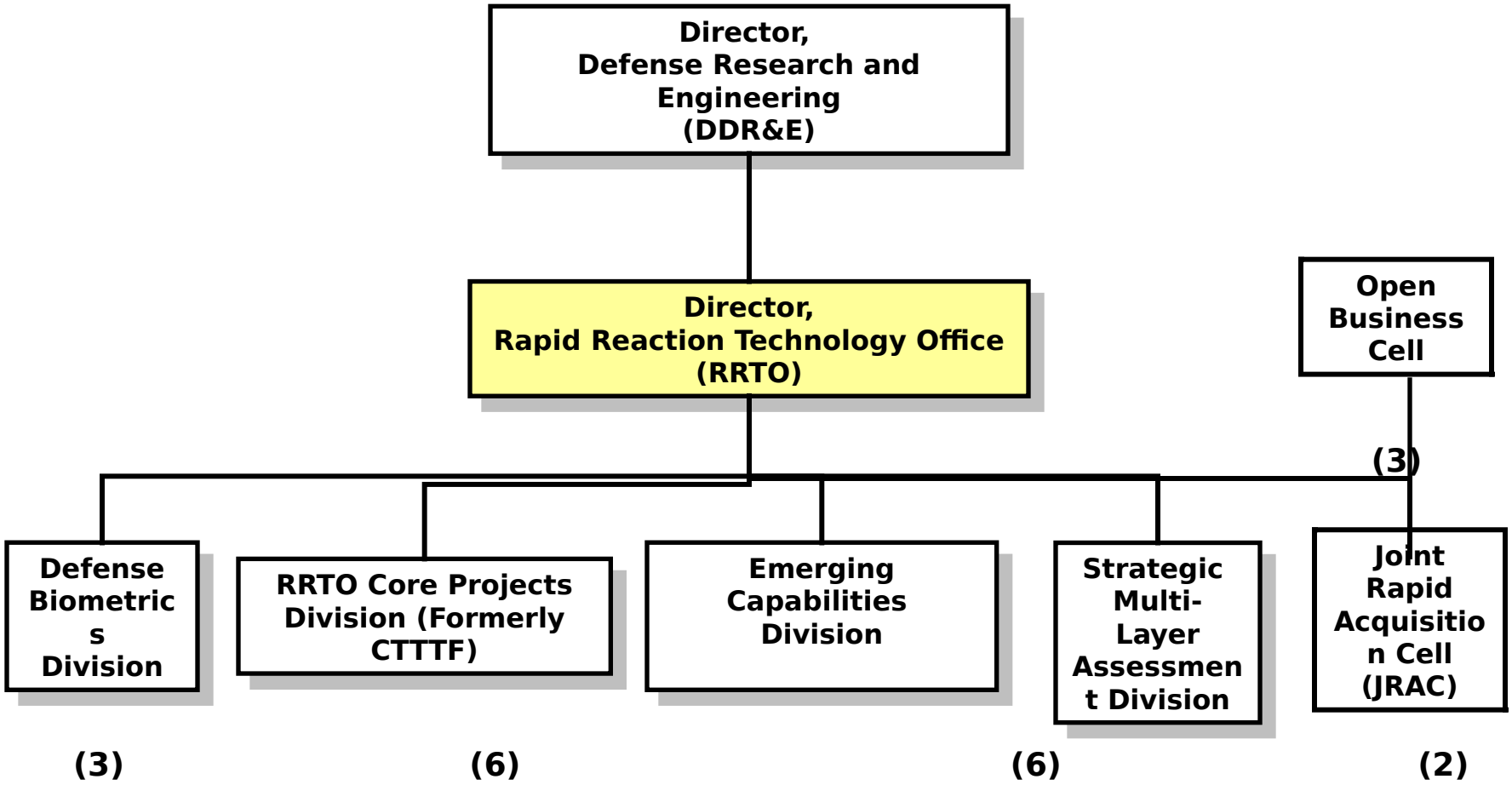

RAPID REACTION Technology Office

Guiding Rationale

- Small offices, horizontally organized. Sacrifice size for good people. Avoid excessive publicity.
- Work to integrate activities, through programs and areas of focus, across each office.
- Focus on short term (6-18 month) activities.
- Constantly study technology trends, geo-political trends and history plus available studies to identify new focus areas.
- Build sequentially on programs. Strategic multi-layer assessment programs reflect lessons learned and growing network.
- Accept an “evolutionary” or “incremental” growth approach.
- Do a lot of small programs, not a few big ones.
- Rely on the network of people to execute programs.
- Avoid programs which compete in the interest space or areas of service expertise. We are too small and under resourced to compete.
- Work to integrate or tie together different programs.

Rapid Reaction Technology Office Overarching Objectives

- Leverage all the DoD science and technology base and those of other Federal Departments
- Stimulate interagency coordination and cooperation
- Identify and examine technological and organizational impacts of emerging and potential, future military issues
- Anticipate adversaries' exploitation of technology, including available and advanced capabilities.
- Provide input and feedback to guide long-term science and technology investments
- Identify and exploit technology developed outside of DoD in the commercial sector, in academia and internationally
- Accelerate fielding of affordable, sustainable capabilities and concepts to counter emerging threats

Rapid Reaction Technology Office Overarching Objectives (cont)

- Provide support to identify and develop near term capability to support irregular warfare needs.
- Identify near term focus areas and facilitate capability development and investment decisions.
- Support of DDR&E overarching objectives.
- Focus primarily on 6-18 month timeframe for development through a supporting spiral development approach.
- Emphasize technology and capability sustainment and transition.
- Anticipate and evaluate emerging and future technology opportunities and needs.

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Director, Defense Biometrics

- **Development of a defense wide biometric capability supporting:**
  - **Identity management**
  - **Tactical biometrics and forensic applications**
  - **Force protection**
- **Develop and coordinate supporting policies to facilitate employment as well as fostering interagency and international cooperation.**
- **Develop and execute a supporting science and technology plan.**
- **Develop a listing of required capabilities to support capability requirements development along with required fiscal resources.**
- **Develop “corresponding” defense Forensics programs including:**
  - **Construction of a forensic science and technology program**
  - **Establishment of a Forensics Executive Steering Group**

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Emerging Capabilities Division

- **Purpose: Anticipate and inform the JCIDS and acquisition processes through risk-reducing prototypes and advanced capability development activities with emphasis on inter-agency cooperation**
- **Outcomes:**
  - **Increased visibility into inter-agency capability gaps of concern to DOD with leveraged funding to stimulate cooperation and develop capabilities**
  - **COCOMs, Services, and Defense Agencies benefit from risk-reduction prototyping and experimentation in advance of (or in conjunction with) formal acquisition programs**
  - **Increased access to inter-agency S&T programs**
  - **Prototypes with military utility provided to COCOM, Service, or Defense Agency for further development or experiments**

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Strategic Multi-Layer Assessment

- SMA provides planning support to COCOMs and warfighters
- Coordinate with the Joint Staff and USSTRATCOM to support global mission analysis.
- Teaming with STRATCOM analytic teams to develop new analytic capabilities in support of specific tasking.
  - Seeks to orient Commander to a decision for action
  - Majority are non-kinetic/low attribution solutions across the Diplomatic, Information, Military and Economic (DIME) spectrum
- Development of multi-disciplined, multi-organizational teams for specific projects:
  - Specific sensor and weapons technical expertise
  - Integration of human, social, cultural and behavioral factors through participation of :
    - Sociologists and anthropologists
    - Universities
    - Economists and non-governmental organizations
    - Interagency partners
  - Production of focused multi-disciplined strategic and technical assessments
- Training and education in the development and application of new analytic tools

Joint Rapid Acquisition Cell (JRAC)

- Act as the singular agent to address, through the Joint Staff, Combatant Commander Joint Urgent Operational Needs Statements (JUONS)
- Monitor development of capabilities in response to Combatant Commander validated JUONS
- Manage the Secretary's Rapid Acquisition Authority
- Coordinate with JIEDDO

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Open Business Cell

- **Establish an Open Business Cell with the following:**
  - **Outreach to non-traditional commercial organizations**
  - **Establish a team of “Technology Brokers” to interface with non-traditional businesses**
  - **Establish a contracting cell using Other Agreements Authority to work with non-traditional businesses in establishing prototype/proof of concept programs**
  - **Facilitate outreach to companies through venture capital groups including In-Q-Tel**

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Interagency Coordination

- **Projects with:**
  - **Department of Homeland Security**
  - **Department of State**
  - **Department of Justice**
  - **Department of Commerce**
  - **Director of National Intelligence**
  - **Central Intelligence Agency**
  - **National Security Agency**
  - **National Reconnaissance Office**
  - **National Geospatial Agency**
  - **Defense Intelligence Agency**
- **Workshops**
  - **Cross Pollination**
  - **Wide Area Surveillance**
  - **Weekly Video Teleconference**
  - **Human, Social, Cultural and Behavioral with Gallup**
  - **Strategic Multi-Layer Assessment workshops**

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Critical "Counter Cycle" Capability Areas

- Intelligence Capability Enhancements
- Surveillance and Reconnaissance
- Training and Education
- Tagging, Tracking and Locating
- Communications and Information Sharing
- "Access Denial" of insurgents to critical capabilities and needs
- Deterrence, Dissuasion, Information Operations
- Identification, including Indications and Warnings of threats
- Detection of threats; both close in and standoff
- Defeat and Consequence Management
- Crisis Response Capabilities
- Multi-level Information Sharing
- Non Kinetic Capabilities

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Developing Focus Areas

- During the past three years the following areas have become the focus for significant S&T Investments:
  - Biometrics & Forensics
  - Ground Based Electronic Warfare
  - Electromagnetic spectrum Monitoring and Management in Urban Environments
  - Cultural & Social Understanding and Modeling
  - Strategic Communications
  - Surveillance & Reconnaissance for CI/CT
  - Enemy Exploitation of Commercial Technology
- What are the emerging areas which will require S&T Investments?
  - Language Translation Capabilities?
  - Non-Kinetic Capabilities?
  - Large Data Handling and Analysis?

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Program Histories

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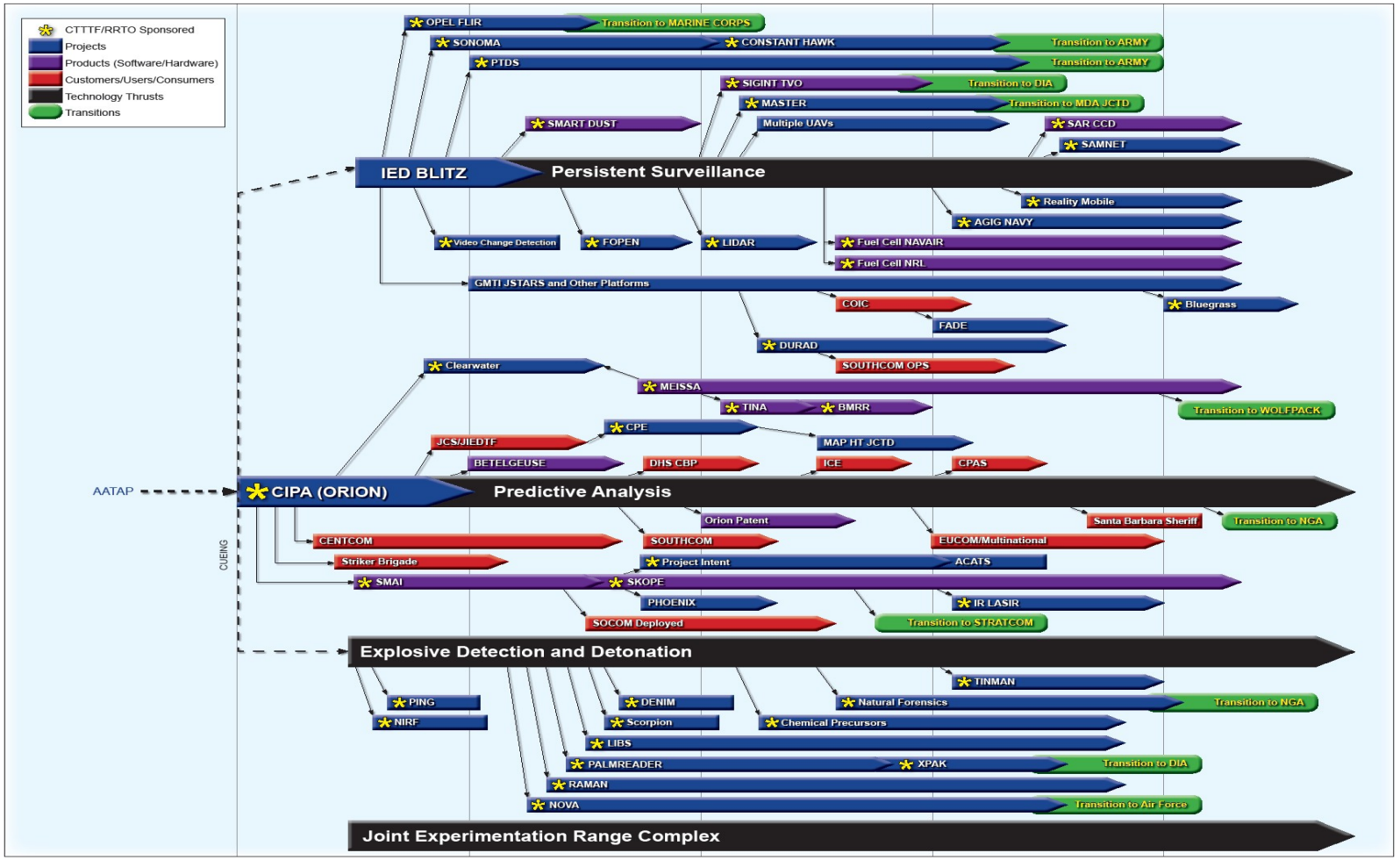
Progenerating Valuable Tools and Technology



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Fiscal Year 2009 and Beyond

- Identify critical focus areas
- Mitigating factors
  - Potential drawdown / refocus from current areas of emphasis
  - Services recapitalization challenges
  - Future levels of defense spending
  - Re-examination of Irregular Warfare strategy
  - Global insurgency / terrorist challenges
  - Competition for resources: energy, food and water
  - Geographic access
  - Smaller but networked terrorist groups
  - Terrorist and criminal groups and organizations affiliations
- Actions
  - Expand Irregular Warfare focus beyond Afghanistan / Iraq
  - Examine terrorist / criminal interfaces
  - Develop non-kinetic capabilities including support for strategic communications
  - Increase interagency coordination

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Fiscal Year 2009 Focus Areas

- Thunderstorm and surveillance system testing
- The interface of law enforcement and military operations
- Strategic Communication and Influence Operations
- Interagency coordination
- Biometrics and forensics capability development
- Establish an open business cell
- Capabilities to support denied area operations
- Small dispersed unit operations
- Autonomous system operations
- Strategic Multi-Layer Assessment

RRTO "Testing History" Joint Experimental Range Complex

- October 2003. The IED challenge emerges.
  - The first thing we need is a "representative" test site in which to examine systems.
- 23 Dec 2003: Construction on the Joint Experimental Range Complex (JERC) begins in Yuma.
  - ATEC Yuma
  - Naval Air Systems Command Special Projects
  - CTTTF
- 15 Jan 2004: First testing at new JERC facility in Yuma.
- Aug 2004: 'What are you doing to test systems?'
  - Commander CENTCOM to the Joint IED Task Force
- Nov 2005: Idea of National Counter Insurgency/Counter Terrorism Test Facility
  - CTTTF cedes Yuma to Joint IED Task Force and Joint IED Defeat Organization
- 2005-Present. CTTTF/RRTO maintains test windows at Yuma for testing.
  - Support to industry, labs and academia with an emphasis on small vendors.
  - RRTO provides test director, facility use, testing support and archives test reports.
  - Testing status reviewed at regular Force Protection VTCs
  - To date 250 systems have been tested at the JERC under CTTTF/RRTO sponsorship

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RRTO "Testing History" IED Blitz

- Sixty day proof of concept that focused ISR assets on a 20 km road segment to detect IEDs and IED emplacement activities
- Employed a "persistent surveillance" approach with multiple sensors including:
  - EO / IR
  - SAR
- Manually fused numerous ISR inputs and developed capabilities to move large amounts of data from theater to CONUS.
- Identified numerous items of interest, none of which were confirmed as IEDs.
- IED Blitz assessed as a failure.
- The IED Blitz identified challenges associated with conducting persistent surveillance and led to development of numerous effective capabilities.
  - GMTI
  - Sonoma / Constant Hawk
  - FOPEN
  - SIGINT TIVO
  - FADE
  - LIDAR
  - COIC
  - SAR CCD
  - Bluegrass
  - Thunderstorm

Does the department need a venue to conduct high risk enterprises/experiments to capture constructive lessons learned?

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RRTO "Testing History" Stiletto

- **Dec 2006: S&T Division of the former Office of Force Transformation assigned to RRTO**
  - **Tactical Relay Mirror System**
  - **Operationally Responsive Space**
  - **Project Wolf Pack**
  - **Stiletto**
- **Stiletto proposed as an operational demonstration platform with potential application to future Navy missions. Not embraced by the Navy.**
- **Under RRTO sponsorship:**
  - **Avoid trying to force the Navy to embrace Stiletto**
  - **Focus on establishing Stiletto as a "test platform" with outreach to laboratories and industry. A maritime environment test bed (at no cost to users) without the paperwork associated with traditional test venues.**
- **Summer 2008: Deploys to Cartegena, Columbia with 10 vendor and "test" systems aboard.**
  - **OPCON – SOUTHCOM TACON – JIATF-South**
- **Oct 2009: Incorporate into Project Thunderstorm and transfer ownership to SOUTHCOM.**

RRTO "Testing History" Bluegrass

- RRTO has been the initial funder / fielder of a number of surveillance capabilities.
  - Derived from the IED Blitz in the fall of 2004
  - GMTI backtracking with JSTARS and P-3 LSRS
  - Sonoma, Mohawk Stare, Constant Hawk wide area electro-optic surveillance
- We continue to develop systems to enhance the base surveillance capabilities.
- There is no "organized" investment to improve the analytic capabilities of GMTI and wide area EO. Most analysis is manual and time consuming
- Project Bluegrass: Develop a data set, with ground truth of GMTI and EO to facilitate future tool and capability development to exploit wide area surveillance systems.
  - Participants included: RRTO, CIA (OCS), NSA and DTRA.
  - MIT/LL functioned as Test Director
  - Data available at no charge to government laboratories and industry for capability development.
  - RRTO and CIA approve each data release.
- 7 Oct 2008: BAA released through TSWG with a series of Bluegrass "Challenge Problems."

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RRTO "Testing History" Project Wolf Pack

- **Support Service / Coalition / Interagency efforts to enhance small unit ground force operations across a spectrum of mission profiles and environments.**
- **Identify, integrate and assess emerging but relatively mature concepts and technologies that are sustainable and deployable.**
  - **Focus on communications**
  - **Produce prototype support equipment for field experimetation**
- **Partners include:**
  - **USMC**
  - **US Army**
  - **JFCOM**
  - **USNORTHCOM**
  - **DHS S&T**
  - **Joint Non-Lethal Weapons Office**
  - **Technical Support Working Group**
  - **Australian Army**
  - **Israeli Ministry of Defense**

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RRTO "Testing History" Thunderstorm

- Operational outgrowth of Project Bluegrass
- Goal is to establish an enduring multi-int ISR test bed focused on the JIATF-S AOR to exercise evolving architectures, emerging capabilities and transformational concepts
  - Demo new capabilities
  - Provide relevant intelligence
  - Encourage greater cooperation
  - Identify ISR CONOP improvements
  - Make data available
- Exercise with a series of ongoing spirals
- MIT/LL acting as test director
- Participants in initial spirals include:
  - JIATF-S
  - CIA
  - NSA
  - NRO
  - DHS
  - Industry partners

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CTTTF/RRTO Retrospect

- **From the onset of CTTTF in May 02 the focus has been on the next challenge:**
  - OEF / OIF
  - Counterinsurgency & IED
  - Surveillance for counterinsurgency
  - Biometrics and forensics
  - Human, social, cultural and behavioral
  - Strategic communications
  - Broadening outreach to government and industry
- **Programs have succeeded because they happen with some degree of speed and have been able to "anticipate" needs.**
  - Partners seem to respond well to informal, flat, cooperative, voluntary participation project management style.

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Counterinsurgency: A Symposium April 16-20, 1962*

- "Whereas in ordinary war the objective is to destroy the enemy and occupy his territory, the guerrilla's aim is control the population. This, therefore, must be the aim of the counter-guerrilla as well."
- The political aspects of guerrilla movements are highly important if not decisive
- Those accustomed to planning in terms of conventional war often do not realize, that it is difficult and sometimes futile to try to identify priority targets for counter-guerrilla operations
- By using "blind terrorism," that is through random bombings and assassinations, insurgents and guerrillas will attract attention to themselves and win latent support. Then by selective terrorism, "a policeman here, a doctor there, or a man who refuses to contribute money to the cause," they are able to isolate the counterinsurgents from the rest of the population and terrorism the rest of the population into silence.
- Once the "battle of silence" is won, the guerrilla can operate freely

*The RAND Corporation

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The Way Ahead

“A good hockey player plays where the puck is. A great hockey player plays where the puck is going to be.”

-Wayne Gretzsky